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Production Performance, Income and Employment Generation through Broiler Business: Revelations in Morena District of Madhya Pradesh

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ABSTRACT

Background: In most developing countries poultry farming is owned by small business owners, farmers and their families. The broiler industry has fewer climate restrictions and more adaptability and in this sector entrepreneurial activities are still unexplored in India. The purpose of this study was to look into the production performance, income and employment generation of broiler production in Morena district of M.P.

Methods: The broiler farms of the Morena district were identified with the help of Veterinary department personnel, commercial hatchery persons and poultry feed manufacturers and a list of 50 farms, was prepared. The list was arranged in the ascending order of the number of birds kept on a farm. From this list, 30 such farms were selected that were continuously in production for at least one year and where proper records were maintained. The list was divided into three categories based upon the number of birds *viz*. small farm group (below 1999 birds), medium farm group (2000 to 4999 birds) and large farm group (5000 and above birds). 5 farms were selected randomly from each farm category. Information was gathered by visiting selected chicken farms and interviewing the owners using a prepared questionnaire. The research study was conducted under the Department of A.H. and Dairying, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj (U.P.). The data were collected for the duration 2019-20.

Results: The present study documented the mean feed conversion ratio, mean Livability percent, mean weight and age at marketing of broilers as 1.83, 95.82 percent, 2.38 kg and 43.8 days respectively for sample as a whole. The average total cost per bird was Rs 161.35. The gross return and net return per bird is found as Rs 185.27 and Rs 23.92 respectively. The benefit-cost ratio is worked out to be 1.15 for the sample as a whole. Rs 6.84 is spent on labour per bird in one production cycle of 56 days. Thus Rs 65664 per farm is spent on employment of labour in 56 days. On the basis of 8 hours working, 3.43 persons have been employed per farm. The statistical analysis using ANOVA found that there is a significant relationship between income and farm size, BCR and farm size.

Key words: BCR, Broiler Poultry, FCR, Fixed cost, Livability, Recurring cost.

INTRODUCTION

Continuous growth and transformation of the livestock sector offer substantial opportunities for agricultural development, poverty reduction, food security gains and improved human nutrition. The sector can also empower rural women and youth, improve natural resource-use efficiency and increase the resilience of households to cope with climate shocks. The size of poultry sector in India is huge and with its price competitiveness and entrepreneurship abilities, India is all prepared to impact greatly in world chicken meat business particularly exports towards Gulf countries (Hellin *et al.*, 2015). Taking a look at all livestock farming practices, the output of money spent is greatest in the chicken meat business so proper designing becomes all the more necessary. So that the farmers get maximum benefits and the young and unemployed population can be attracted towards this means of livelihood. In the livestock sector of India poultry has created a niche for itself showing an average annual growth rate of 9% from 2001 to 2019 (DAHDF, 2020).

The status of poultry reflects that the total poultry in the country was 851.81 million in 2019, an increase by 16.8% over the previous Census (2012). The total number of backyard poultry in the country was 317.07 million in 2019, which increased by 45.8% over the previous Census (2012). The total commercial poultry in the country is 534.74 million

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in 2019, increased by 4.5% over the previous Census (2012). The major states in Poultry are Tamil Nadu Andhra Pradesh, Telangana and West Bengal. MP ranks in the middle in poultry birds in India with 15th Position. The total number of poultry birds in Madhya Pradesh was 66.59 lakhs and the total number of poultry birds in Morena was 1.64 lakhs in 2019 (20th Livestock Census). Out of 51 districts of Madhya Pradesh, Jabalpur has the highest poultry birds with about 26.58 lakhs and Morena falls in the middle with 24th position. The total Number of Poultry as per the 19th livestock census in 2012 in Morena was 49, 539 and increased to 1,64,252 in 2019 as per the 20th livestock census. The growth for poultry in Morena was estimated as 231.56 percent during 2012 to 2019.

The broiler industry has fewer climate restrictions and more adaptability to varied forms of farm climate available in India (Singh *et al.*, 2010). It has been computed that in the chicken population of 729 million comprising 30% of them are layers and 40% are broilers, the small and medium farmers generally practice contract farming systems for large integrators and there are about 30 million farmers engaged in backyard poultry according to the 19th livestock census (Gaware *et al.*, 2021). India produced 3.8 MMT of poultry meat in 2017-18. Maharashtra had 15% share in total poultry meat production followed by Tamil Nadu, Haryana and West Bengal. Normally, India faced lack of processing facilities and this is accompanied by small capacity production units without any branding export of chicken meat from India has been abysmally less. Still, India is known to export minute amounts of freeze-dried sole broiler meat along with cut-up parts to South Asia, the Middle East and now recently to Japan and Southeast Asia according to USDA FAS 2016 (Nanda *et al.*, 2022). In most developing countries poultry farming is owned by small business owners, farmers and their families. Entrepreneurial activities and the industrial revolution are still unexplored in this particular agricultural sector (Roy *et al*., 2019). The purpose of this study was to look into the current technological adoption, Production performance and economics of broiler farming along with employment generation from broiler production in Madhya Pradesh's Morena district. The poultry extension services of the Krishi Vigyan Kendra, Morena affiliated to Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, cover the majority of poultry farms in the district.

MATERIALS AND METHODS

The study was done to find the impact of broiler business on income and employment generation for rural prosperity. Madhya Pradesh is selected purposively as it is in the middle of Indian states in terms of poultry birds. It ranks 15th in India in terms of the number of poultry birds and growth is as 39.94% in 2019 from 2012. Morena district in Madhya Pradesh is also selected purposively. It has also a high number of poultry birds and ranked 24th district in 51 districts of MP in poultry in 2019 and its growth was 231.56% from 2012 to 2019. The broiler farms of the Morena district were identified with the help of Veterinary department personnel, commercial hatchery persons and poultry feed manufacturers and a list of 50 farms, was prepared. The list was arranged in the ascending order of the number of birds kept on a farm. From this list, 30 such farms were selected that were continuously in production for at least one year and where proper records were maintained. The list was divided into three categories based upon the number of birds *viz*. small farm group (below 1999 birds), medium farm group (2000 to 4999 birds) and large farm group (5000 and above birds). Then, a sample of 5 farms from each category was selected at random. The research study was conducted under the Department of A.H. and Dairying, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj (U.P.). The data were collected for the duration 2019-20.The Selected farms were classified into 3 groups based on their size and placed in ascending order based on flock size as illustrated in Table 1.

Information was gathered by visiting selected chicken farms in the Morena district and interviewing the poultry entrepreneurs using a prepared questionnaire. The questionnaire includes the questions regarding socio-economic attributes of the farmers, size of unit; occupational status and general education level of diverse farmers. The major analytical means used for the investigation involves tabular analysis with certain statistical tools and economic principles: for assessing the Production performance, feed consumption, feed conversion ratio, livability percentage, broiler age at marketing (days) and, body weight of broiler at marketing (Kg) were calculated. For the economic evaluation, data related to investment in building and equipment, expenditure on chicks, feed, labour, electricity, medicine and other miscellaneous items and income from the sale of live broilers, manure and empty feed bags were obtained from the farmers for each batch. Finally, gross returns, net returns and benefit-cost ratios were calculated. For analysis, simple averages and percentages were used. For studying the financial viability of poultry enterprises, the benefit-cost ratio was calculated using standard procedures. The study also used ANOVA for analyzing income and farm size, feed conversion ratio (FCR) and farm size, Benefit-Cost Ratio and farm size, cost and farm size and return and

Table 1: The classification of broiler farms according to the number of broilers.

Designated size of farm	Number of broilers	Number of farms
Small	Up to 1999	5
Medium	From 2000-4999	5
Large	5000 and above	5
Total number of farms		15

farm size for each of the small farms (with 1-1999 birds), Medium farms (with 2000-4999 birds) and large farms (5000 and above) in the Morena district.

RESULTS AND DISCUSSION

Distribution of broiler birds

The details about the total number of broiler farms and the average number of broilers per farm under different groups (farm size groups) are presented in Table 2. There were 5 farms each in the small, medium and large-sized category in Morena district. The mean values for a number of broilers in small, medium and large size farms (Mean±S.D.) were 1160±427.78, 2940±684.10 and 5500±500 birds respectively. The average number of broilers worked out to be 9600 per farm and it varied from 1160 birds for small farms to 5500 birds for large farms.

Production performance

For production performance, the data on average feed conversion ratio, livability percentage, age at marketing and weight at marketing were calculated and are presented in Table 3.

Feed conversion ratio (FCR)

The mean Feed conversion ratio for small, medium and large size farms were 1.87±0.02, 1.83±0.01 and 1.79±0.01 respectively with an overall average of 1.83 (Table 3). Rajendran (1998) and Shaikh and Zala (2011) recorded overall feed conversion ratio of 2.07 and 1.97 respectively which is higher than the present study which may be attributed to improvement in breed, feed and better healthcare for broiler poultry bird. FCR was found as 1.86 in Wayanad, Kerala (Sudarshan *et al*., 2021). FCR was found as 1.69 in case of basal diet and 2 percent commercial herbal growth promoter (Mahanta 2017). FCR was found 1.60 in farms of Jaunpur, UP (Singh, 2016) and FCR was found as 1.58, 1.54 and 1.48 in summer, rainy and winter season, respectively (Govind *et al*., 2023). In these studies, the FCR was found similar but partially lower than the present study.

Livability percentage

The mean livability percentage for small, medium and large size farms were 95.54±0.91, 95.72±0.40 and 96.19±0.18 respectively with an overall average of 95.82 percent (Table 3). Rajendran (1998) has documented livability of 92.91 percent and 93.26 per cent individually in small and large size farms which is lower than the present study higher livability in present study may be attributed to better management practices during the present time. Shaikh and Zala (2011) stated that the livability percentage of 94.42, 94.54 and 94.72 in small, medium and large size broiler poultry units individually is closer to the present findings. Al-Dawood and Al-atiyat (2022) have found livability of the three Strains of broiler as 95.13% (Ross), 95.64% (Lohmann) and 92.94% (Hubbard) Which was found similar with present study.

Weight at marketing

The mean weight at the marketing of broilers for small, medium and large size farms were 2.46±0.05 kg, 2.36±0.05 kg and 2.32± 0.04 Kg respectively with an overall average weight of 2.38 kg (Table 3). It can be seen from the table that body weight at marketing gradually decreased as the farm size increased. The weight of marketing recorded in this study is better than the weights recorded by Rajendran (1998) and Shaikh and Zala (2011). Mahajan (2021) has found that weight at marketing in major markets in US is 2.72 kg. The body weight was found as 1580.2 with basal dose and 1 per ent giloe (Tiwari and Rahal, 2019). The overall improvement in body weight in this study might be due to better quality feed, feeding practices, better healthcare and improved breed and strain of broiler birds.

Table 2: The average number of broilers under different farm-size groups.

Farm size group	Farms		Birds		Mean±S.D.
	Number	% to total	Number	% to total birds	
Small farms (below 1999)	05	33.33	5800	12.21	1160±427.78
Medium farms (from 2000 to 4999)	05	33.33	14700	30.95	2940±684.10
Large farms(5000 and above)	05	33.33	27000	56.84	5500±500
Total farms	15	100	47500	100	9600

Table 3: Mean feed conversion ratio, livability percentage, body weight and age at marketing and of broilers.

Parameters	Farm size group			Overall
	Small farms (Mean±S.D.)	Medium farms (Mean±S.D.)	Large farms (Mean±S.D.)	
Feed conversion ratio	1.87±0.02	1.83±0.01	1.79±0.01	1.83
Livability percent	95.54±0.91	95.72±0.40	96.19±0.18	95.82
Body weight at marketing (Kg)	2.46±0.05	2.36±0.05	2.32±0.04	2.38
Age at marketing (Days)	43.8±0.84	43.4±0.55	43±0.71	43.4

Age at marketing

The mean Age at marketing of broilers for small, medium and large size farms were 43.8±0.84 days, 43.4±0.55 days and 43 ±0.71 days respectively with an overall value of 43.4 days (Table 3). Age at marketing in the present study was found to be lower than the findings of Rajendran (1998) and Saravanan (1998) however Shaikh and Zala (2011) reported the age at marketing at 42.57 days, 42.38 days and 42.05 days in small medium and large farms, respectively which is closer to the present finding. After selling of broiler, other cleaning and disinfection activities are done to start the new production cycle. The total production cycle is considered 56 days. It is made up of two periods' growth period (43.4 days) and additional activities period (12.6 days). The economics is analyzed for 56 days total period.

Economic analysis

Investment on the creation of fixed assets

For calculating investment on the creation of fixed assets actual cost incurred on the construction of broiler sheds and purchase of equipment were taken into consideration. The details are presented in Table 4 which indicates that the cost of broiler shed construction was the major item constituting 79.97, 80.82 and 80.98 per cent in small, medium and large farms, respectively. It was followed by investment on equipment which was 20.03, 19.18 and 19.02 per cent respectively for small, medium and large size farms.

Cost appraisal of raising broiler birds

The total cost per broiler and the breakup of the total cost into different components that constitute the total cost are presented in Table 5 and 6 respectively. The average total

Table 4: Investment on the creation of fixed assets.

Parameters	Farm size group			Overall
	Small farms (Mean±S.D.)	Medium farms (Mean±S.D.)	Large farms (Mean±S.D.)	
On broiler house (Rs)	127000±47116.87	320200±106537.32	655000±67082.04	367400
	(79.97)	(80.82)	(80.98)	(80.82)
On equipment (Rs)	31800±4231.07	76000±13684.05	153800±33671.80	87200
	(20.03)	(19.18)	(19.02)	(19.18)
Total (Rs)	158800	396200	808800	454600

Note: Figures within the parentheses indicate percentage to total.

Table 5: Total cost of different farm sizes (`/bird).

Components	Farm size group			All farms
	Small farm (Mean±S.D.)	Medium farm (Mean±S.D.)	Large farm (Mean±S.D.)	
Total cost	171.04±7.57	159.51±1.92	153.51±2.25	161.35

Table 6: Breakup of different components of per bird cost (`) on different farm sizes.

Components	Farm size group			All farms
	Small farms	Medium farms	Large farms	
Fixed cost				
Rental value of land	1.34 (0.78)	0.48 (0.30)	0.50 (0.32)	0.77 (0.47)
Depreciation of building	0.85 (0.50)	0.83 (0.52)	0.91 (0.59)	0.86 (0.54)
Depreciation of equipments	0.73 (0.43)	0.62 (0.39)	0.71 (0.46)	0.69 (0.28)
Interest innon-recurring cost	2.47 (1.45)	2.38 (1.49)	2.62 (1.70)	2.49 (1.55)
Total non-recurring cost	5.39 (3.15)	4.31 (2.70)	4.73 (3.08)	4.81 (2.98)
Recurring cost				
Cost of day-old chick	42.13 (24.63)	40.28 (25.25)	38.98 (25.39)	40.46 (25.09)
Feeds	101.41 (59.29)	102.22 (64.08)	95.26 (62.05)	99.63 (61.81)
Medicine and vaccines	1.34 (0.78)	1.48 (0.93)	2.51 (1.63)	1.78 (1.11)
Labour	9.76 (5.71)	5.07 (3.18)	5.70 (3.71)	6.84 (4.2)
Miscellaneous cost	8.02 (4.69)	3.34 (2.09)	3.63 (2.37)	5.00 (3.05)
Interest on working capital	2.99 (1.75)	2.80 (1.76)	2.69 (1.75)	2.83 (1.75)
Total recurring cost	165.65 (96.85)	155.20 (97.29)	148.78 (96.92)	156.54 (97.02)
Total cost	171.04 (100)	159.51 (100)	153.51 (100)	161.35 (100)

Note: Figures within the parentheses indicate percentage to total.

cost was `` 171.04±7.57, ` 159.51±1.92 and ` 153.51±2.25 per broiler respectively for small, medium and large size farms with a value of ` 161.35 for a sample as a whole. The average total cost for small, medium and large size farms is higher than the cost reported by Rajendran *et al.* (2008), Singh *et al.* (2010), Shaikh and Zala (2011) and Balaumurgan and Manoharan (2013). On reviewing the size-wise total average cost per broiler, it can be seen that it was highest in small farms followed by medium and large size farms. This finding shows that the cost of production per bird decreased with an increase in farm size. It was also observed that on an average variable cost formed 97.02 per cent and fixed cost 2.98 per cent of total cost. On studying the factor-wise cost on an average, it is observed that the feed cost accounted for the maximum share (61.81%) of the total cost, followed by chick cost (25.09%) and labor wages (4.2%). Thus, these three major components constituted 91.1 per cent of the total cost of broiler production. The findings on feed cost, chick cost and labor cost are in agreement with the findings of Singh *et al.* (2010) where these constituted 82.99 per cent of variable cost. The findings on feed cost and chick cost are in agreement with the findings of Rajendran *et al.* (2008), Shaikh and Zala (2011) who have documented that feed cost and chick cost constituted two major components of total cost however differ from them in case of labour wages, in present study labor wages were the third major component of total cost of broiler production in place of depreciation on building component.

Returns from broiler farms

Gross returns

The returns realized from various sources are depicted in Table 7, revealing that on average the returns from the sale of broilers amounted to ` 183.62 (99.11%) per broiler. The next source of income was the sale of manure ` 1.24 (0.67%) and the sale of empty gunny bags ` 0.41 (0.22%). These observations are in agreement with the findings of Singh *et al.* (2010), Shaikh and Zala (2011) and Balamurugan and Manoharan (2013) for income from the sale of broilers and not in agreement with other income sources (sale of manure and sale of empty gunny bags) where they have documented sale of empty gunny bag as a second major source of income contradictory to present study where the sale of manure was found a second major source of income after sale of broiler. The gross returns per broiler decreased with an increase in farm size, which might be due to lowered body weight and reduced age at marketing in medium and large farms than in small farms. These observations are agreement with the earlier report of Singh *et al.* (2010), Shaikh and Zala (2011) and Balamurugan and Manoharan (2013).

Net returns and Benefit-cost ratio

Net returns per broiler and benefit-cost ratios were calculated and are presented in Table 8. The net returns per bird over the total cost were the highest on large farms (` 28.32), followed by medium (` 24.29) and small (` 18.62) farms with an overall figure of ` 23.92. On perusal of data it was observed that as farm size increased, the net returns per broiler also increased. The increasing trend of net income could mainly be attributed to the economies of scale on the large farms. This is in agreement with the earlier observations of Singh *et al.* (2010), Shaikh and Zala (2011) and Balamurugan and Manoharan (2013). Dwivedi et al (2020) has found the B:C ratio as 1.44 for all the farms. It was also observed in the present study the B:C ratio for all farms found as 1.15 and it is increased with an increase in farm size, which indicates that the large farms were economically more viable.

Table 7: Gross returns from different sources per broiler (`/bird).

Components	Farm size group			All farms
	Small farm (Mean±S.D.)	Medium farm (Mean±S.D.)	Large farm (Mean±S.D.)	
Sale of broiler	188.01±4.68 (99.13)	182.08±4.84 (99.06)	180.76±3.49 (99.14)	183.62 (99.11)
Sale of manure	1.25±0.17 (0.65)	1.30±0.22 (0.71)	1.16±0.09 (0.64)	1.24 (0.67)
Sale of gunny bags	0.40±0.04 (0.22)	0.42±0.02 (0.23)	0.41±0.02 (0.22)	0.41 (0.22)
Total returns	189.66 (100)	183.80 (100)	182.33 (100)	185.27 (100)

Note: Figures within the parentheses indicate percentage to the total.

Table 8: Net returns, benefit-cost ratio in broiler farms in Morena (`/bird).

Components	Farm size group			All farms
	Small farm (Mean±S.D.)	Medium farm (Mean±S.D.)	Large farm (Mean±S.D.)	
Total cost	171.04±7.57	159.51±1.92	153.51±2.25	161.35
Gross returns	189.66±4.80	183.80±4.93	182.33±3.45	185.27
Net returns	18.62±4.53	24.29±4.17	28.32± 2.34	23.92
Benefit-cost ratio	1.11±0.03	1.15±0.03	1.19±0.02	1.15

Higher employment and income from broiler business

We have found that the average time taken by the broiler for the market was 56 days and the average number of birds per farm was 9600. The average total cost per bird was Rs 161.35 and the total cost per farm was Rs 15, 48,960 and gross return per bird was found as Rs 185.27 and the gross return per farm was Rs 1778592. The net return per bird was found as Rs 23.92 and the net return per farm is found as Rs 2,29,632. Rs 6.84 (0.16 hours) was spent on labour per bird in 56 days. Thus Rs 65664 per farm was spent on the employment of labour in 56 days. The average cost of one man day was found as Rs 342.22 (for 8 hours). One production cycle provides 191.88 man-days of employment. On the basis of 8 hours working, 3.43 persons have been employed per farm. Thus, a high income is generated for employment in the broiler business (Table 9).

ANOVA table for analysis

The study also used ANOVA for analyzing income and farm size, feed conversion ratio (FCR) and farm size, BCR and farm size, cost and farm size and net return and farm size for each of the small farms (with 1-1999 birds), medium farms (with 2000-5000 birds) and large farms (5000 and above) in the Morena district (Table 10). It was found that there is significant relationship between income and farm size, BCR and farm size. This implies that with an increase of farm size, the income or the cost return of the farms and benefit-Cost ratio increases significantly. However, FCR and farm size do have not such significant relationship.

Challenges in poultry business

The important challenges in poultry business are poor infrastructure for production and processing leading to hindrance in the export of poultry products. Occurrence of Salmonella, Avian influenza and other communicable diseases in poultry are main factors for economic losses to farmers. High maize and soya price fluctuation leading to low availability and poor quality of poultry feed at reasonable prices and lack of undefined standards practices leading to poor output from this enterprise.

Government policies for poultry promotion in India

Keeping in mind the importance of poultry in farmers' prosperity, the Central government is supporting poultry farming through the following schemes in all states.

a. Animal husbandry infrastructure development fund (AHIDF)

Hon'ble Prime Minister has announced for setting up of Rs. 15000 crore Animal Husbandry Infrastructure Development Fund (AHIDF) under the Atma Nirbhar Bharat Abhiyan stimulus package in 2020. One of the objectives of the scheme is to fulfill the objective of protein-enriched quality food requirement of the growing population of the country and prevent malnutrition. The following activities have been included for availing credit under AHIDF.

Table 9: Total cost, gross return and net return per farm in broiler business.

Days required for production cycle	Labour cost Per bird cost, Rs	Average birds/farm, no's	Total money spent on labour per farm, Rs	Total cost per bird, Rs	Total cost per farm, Rs	Gross income generated per Bird Rs	Gross income generated per farm, Rs	Net income generated per Bird, Rs	Net income generated per farm, Rs
56	6.84	9600	65664	161.35	1548960	185.27	1778592	23.92	229632

Table 10: The result of analysis tests involving the performance of the farms, FCR and BCR with farm size in Morena.

Analysis test	Test between	F-test	Value of test done
ANOVA	Income and farm size	42.318	P<0.005
ANOVA	FCR and farm size	1.316	P=0.307 (P>0.005)
ANOVA	BCR and farm size	49.308	P=0.000
ANOVA	Cost and farm size	13.578	P<0.005
ANOVA	Net return and farm size	13.398	P<0.005

i. Technologically assisted poultry farms (Technologically assisted, layer farm with an environmentally controlled system, broiler breeder farms with environmentally controlled system and Hatcheries with environmentally controlled facilities).
ii. Meat processing and value addition infrastructure.
iii. Establishment of animal feed plant (Poultry feed). Eligible beneficiaries farmer producer organization (FPO) b) Private companies c) Individual entrepreneurs d) Section 8 companies e) micro small and medium enterprises availing credit facilities will get 90% loan for which 3% interest subvention is provided by the central government. The central government is also providing a credit guarantee of 25% of total borrowings for those projects which are fulfilling the definition of MSME projects.

a. National livestock mission

Under national livestock mission, for the development of entrepreneurs in rural poultry, the central government is providing a 50% subsidy upto Rs 25.00 Lakhs to establish parent farm, rural hatchery, brooder cum mother unit for production of hatching eggs with minimum 1000 parent layers and chicks and rearing of the said chick upto four weeks in the mother unit. The eligible entities are self help group (SHG)/farmers producer organizations (FPO)/ farmers cooperatives organizations (FCOs)/Joint liability groups (JLGs) and section 8 companies.M.P.government mainly focuseson livelihood security through providing subsidies up to 75% onthe rearing of birds for small rural poultry farmers of the state.

CONCLUSION

The study has revealed that the livability percentage of broilers does not change with respect to the farm size. The average body weight and age at marketing, irrespective of farm size, have been found as 2.38 kg and 43.4 days. Average cost of cost of production has been found to be ` 161.35 per broiler. It has also been found that recurring costs form 97.2 (` 156.54) per cent and fixed costs 2.98 (` 4.81) percent of the total cost. The study has revealed that the cost of production per bird decreases with an increase in farm size. The feed cost has been found to be the highest at 61.81% (` 99.63), followed by chick cost at 25.09% (` 40.46), labor at 4.2% (` 6.84) and others at 8.91% (` 14.42). The total cost per farm was Rs 15, 48,960 and gross return per bird was found as Rs 185.27 and gross return per farm was Rs 1778592. The net return per bird was found as Rs 23.92 and the net return per farm was found as Rs 2, 29,632. Rs 6.84 is spent on labor per bird in 56 days. Thus Rs 65664 per farm was spent on employment of labour in 56 days. As the farm size increases, the net return per broiler also increases. The benefit-cost ratio has been found 1.15 for the sample as a whole and it increases withan increase in farm size, indicating that as the size increases, the net margin over the rupee invested in broilers also increases. The statistical analysis using ANOVA found that there is a significant relationship between income and farm size, BCR and farm size. This implies that with an increase in farm size, the income of the farms and Benefit-Cost Ratio increases significantly. However, FCR and farm size do have not such a significant relationship. The central government provides support to poultry farming through the animal husbandry infrastructure development fund (AHIDF) and the national livestock mission to enhance the prosperity of farmers of all states.

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Conflict of interest

All authors declared that there is no conflict of interest.

REFERENCES

20th Livestock census, (2019). Government of India.

Al-dawood, A. and Al-atiyat, R. (2022). A comparative study on growth parameters of three broiler chicken strains from Jordan. Brazilian Journal of Poultry Science. eRBCA-2021-1534.

Balamurugan, V. and Manoharan, M. (2013). Cost and benefit of investment in integrated broiler farming A case study. International Journal of Current Research and Academic Review. 2: 114-123.

Dwivedi, S., Sharma, S., Isher, A.K., Sharma, P.K., Rai, P.K. (2020). Financial analysis of broiler production units. Journal of Animal Research. 10: 821-825.

Gaware, U.P., Ganvir, B.N., Thawale, S.M., Ahmad, N. (2021). Export competitiveness and direction of trade of eggs in india: An Economic Assessment. Journal of Community Mobilization and Sustainable Development. 16: 543-547.

Govind, Gupta, R., Kumar, D, Meena, A.K., Kour, N. (2023). Study the feed cost and feed conversion ratio of broiler production in Kannauj District of Uttar Pradesh, India. Biological Forum -An International Journal. 15: 1201-1204.

Hellin, J., Krishna, V.V., Erenstein, O., Boeber, C. (2015). India's poultry revolution: implications for its sustenance and the global poultry trade. International Food and Agribusiness Management Review. 18: 151-163.

Mahajan, P., Martinez, D.A., Weil, J., Suesuttajit, N., Umberson, C., Mullenix, G., Hilton, K.M., Beitia, A., Coon C.N. (2021). Review: Physiological growth trend of current meat broilers and dietary protein and energy management approaches for sustainable broiler production. The International Journal of Animal Biosciences. 15: 1751-7311.

Mahanta, J.D., Borgohain, B., Sarma, M. and Sapcota, D. (2017). Effect of dietary supplementation of herbal growth promoter on performance of commercial broiler chicken. Indian Journal of Animal Research. 51: 1097-1100.

Nanda, K.T., Das, S., Gulati, A. (2022). Dairy value chain. Agricultural Value Chains in India. Springer, Singapore. 195-226.

Rajendran, K. (1998). A study on economics of broiler production in and around Palladam area of Coimbatore district. M.V. Sc. Thesis, Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Science University, Namakkal.

Rajendran, K., Mohan, B., Viswanathan, K., Edwin, S.C. (2008). A study on cost of production of broiler at market age at Palladam Area. Tamil Nadu Journal of Veterinary and Animal Sciences. 4: 69-70.

Roy, D. and Laha, A. (2019). Changing dynamics of entrepreneurial activities in poultry sector: A micro-empirical study of contact broiler farming in a selected village of raina 2 block, West Bengal. Journal of Entrepreneurship and Management. 8:31-40.

Saravanan, G. (1998). System of broiler marketing in Palladam broiler pocket, Unpublished *M.V.Sc. Thesis*, Tamil Nadu Veterinary and Animal Science University, Chennai.

Shaikh, A.S. and Zala, Y.C. (2011). Production performance and economic appraisal of broiler farms in Anand district of Gujarat. Agricultural Economics Research Review. 24: 317-323.

Singh, A.K. (2016). An economic analysis of broiler production in Jaunpur District of Uttar Pradesh, India. MSc thesis BHU, Varanasi.

Singh, V.P., Sharma, V.K., Sidhu, M.S., Kingra, H.S. (2010). Broiler production in Punjab - an economic analysis. Agricultural Economics Research Review. 23: 315-324.

Sudharsan, C., Senthil, S.M., Chacko, B., Juliet, S., Nair, S.N., Bency, A., Muneer, A.K. (2021). Influence of dietary substitution of palm oil by rapeseed oil at different levels on growth performance and economics of broilers. Indian Journal of Animal Research. 55: 445-450. doi: 10.18805/ijar.B-3969.

Tiwari G. and Rahal A. (2020). Production performance in broilers on supplementing giloe and cinnamon. Bhartiya Krishi Anusandhan Patrika. 34: 211-215. doi: 10.18805/BKAP189.